Volunteer Lake Assessment Program Individual Lake Reports

RUSSELL RESERVOIR, HARRISVILLE, NH

MORPHOMETRIC DATA

Watershed Area (Ac.):	7,031	**Max. Depth (m):**	4.7	**Flushing Rate (yr^{-1}):**	93.5
Surface Area (Ac.):	26	**Mean Depth (m):**	1.6	**P Retention Coef:**	0.14
Shore Length (m):	1,900	**Volume (m^3):**	170,000	**Elevation (ft):**	1160

TROPHIC CLASSIFICATION

Year	Trophic class
1988	MESOTROPHIC

KNOWN EXOTIC SPECIES

The Waterbody Report Card tables are generated from the 2012 305(b) report on the status of N.H. waters, and are based on data collected from 2001-2011.

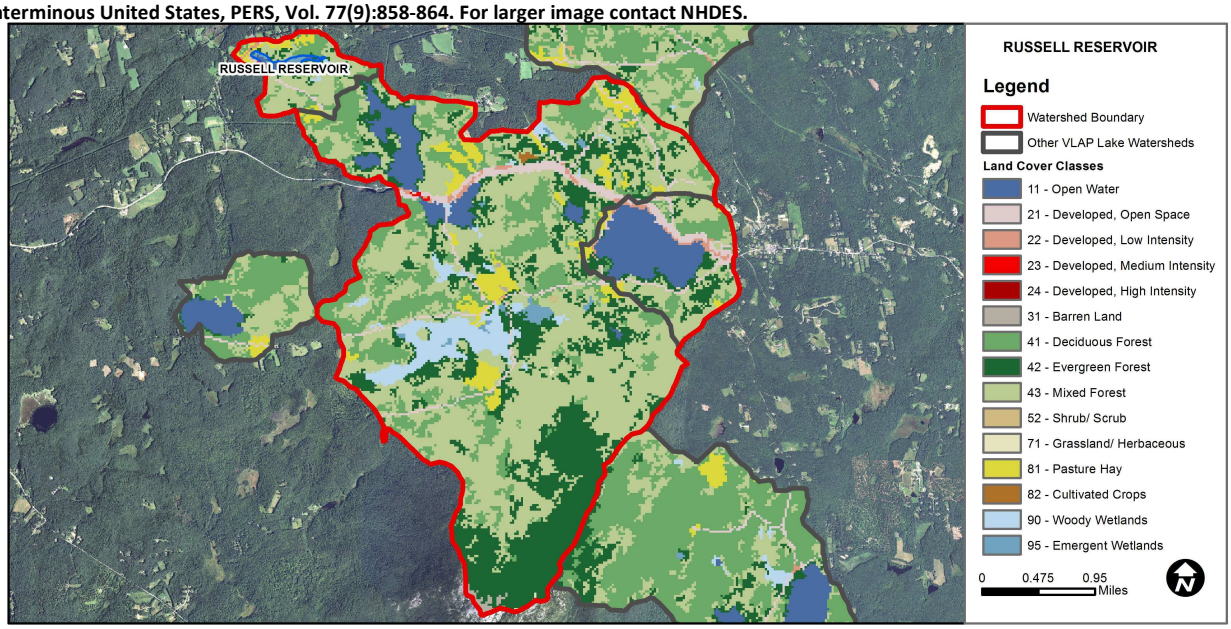
Designated Use	Parameter	Category	Comments
Aquatic Life	Phosphorus (Total)	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
	pH	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	D.O. (mg/L)	Encouraging	< 10 samples and no exceedance of criteria. More data needed.
	D.O. (% sat)	Slightly Bad	>10% of samples exceed criteria by a small margin (minimum of 2 exceedances).
	Chlorophyll-a	Good	>/=5 samples and median is < threshold but > 1/2 threshold value.
Primary Contact Recreation	E. coli	Encouraging	>2 samples exist that are > 75% of geometric mean criteria, but not enough samples to calculate geomertic mean. No single sample exceedances. More data needed.
	Chlorophyll-a	Encouraging	< 10 samples and no exceedance of criteria. More data needed.

BEACH PRIMARY CONTACT ASSESSMENT STATUS

RUSSEL RESERVOIR - CHESHAM BEACH	E. coli	Bad	>/=1 exceedance(s) of geometric mean criterion and/or >/=2 exceedances of single sample criterion, with 1 or more >2X criteria.

WATERSHED LAND USE SUMMARY

Fry, J., Xian, G., Jin, S., Dewitz, J., Homer, C., Yang, L., Barnes, C., Herold, N., and Wickham, J., 2011. Completion of the 2006 National Land Cover Database for the Conterminous United States, PERS, Vol. 77(9):858-864. For larger image contact NHDES.

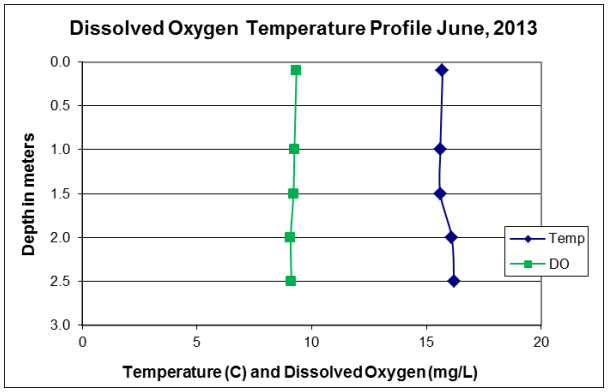


Land Cover Category	% Cover	Land Cover Category	% Cover	Land Cover Category	% Cover
Open Water	6.9	Barren Land	0.31	Grassland/Herbaceous	0.04
Developed-Open Space	3.72	Deciduous Forest	16.16	Pasture Hay	4.48
Developed-Low Intensity	0.64	Evergreen Forest	22	Cultivated Crops	0.08
Developed-Medium Intensity	0.04	Mixed Forest	40.66	Woody Wetlands	3.77
Developed-High Intensity	0	Shrub-Scrub	0.05	Emergent Wetlands	0.78

VOLUNTEER LAKE ASSESSMENT PROGRAM INDIVIDUAL LAKE REPORTS
RUSSELL RESERVOIR, HARRISVILLE, NH
2013 DATA SUMMARY

OBSERVATIONS AND RECOMMENDATIONS (*Refer to Table 1 and Historical Deep Spot Data Graphics)*

- **CHLOROPHYLL-A:** Chlorophyll levels were average for most lakes and slightly less than the state median. Visual inspection of historical data indicates slightly increasing chlorophyll since monitoring began.
- **CONDUCTIVITY/CHLORIDE:** Deep spot and tributary conductivity were low and less than the state median. Visual inspection of historical data indicates decreasing (improving) epilimnetic conductivity since monitoring began. We hope to see this continue!
- **TOTAL PHOSPHORUS:** Deep spot and tributary phosphorus levels were average and approximately equal to the state median. Visual inspection of historical data indicates slightly increasing epilimnetic phosphorus since 2007.
- **TRANSPARENCY:** Transparency was slightly lower in 2013 and potentially due to stormwater runoff from significant rain events prior to sampling. Historical trend analysis indicates relatively stable transparency with moderate variability between years.
- **TURBIDITY:** Turbidity was elevated at all stations likely due to stormwater runoff from significant rain events prior to sampling.
- **PH:** Deep spot and tributary pH levels were lower than desirable range 6.5 – 8.0 units and potentially critical to aquatic life. Visual inspection of historical data indicates relatively stable epilimnetic pH.
- **DISSOLVED OXYGEN:** Dissolved oxygen levels were high throughout the water column and sufficient to support aquatic life.
- **RECOMMENDED ACTIONS:** Significant rain events prior to sampling likely caused the increased turbidity and decreased transparency. The increased frequency of high volume and intensity storm events highlights the importance of reducing stormwater runoff to waterbodies. Identify areas in the watershed prone to stormwater erosion and implement best management practices to capture and infiltrate stormwater runoff before it reaches waterbodies. DES' "Homeowner's Guide to Stormwater Management" is a great resource. Increase monitoring frequency to three times



NH Median Values: Median values for specific parameters generated from historic lake monitoring data.
Alkalinity: 4.9 mg/L
Chlorophyll-a: 4.58 mg/m^3
Conductivity: 40.0 uS/cm
Chloride: 4 mg/L
Total Phosphorus: 12 ug/L
Transparency: 3.2 m
pH: 6.6

NH Water Quality Standards: Numeric criteria for specific parameters. Results exceeding criteria are considered a water quality violation.
Chloride: < 230 mg/L (chronic)
E. coli: > 88 cts/100 mL – public beach
E. coli: > 406 cts/100 mL – surface waters
Turbidity: > 10 NTU above natural level
pH: 6.5-8.0 (unless naturally occurring)

Table 1. 2013 Average Water Quality Data for RUSSELL RESERVOIR

Station Name	Alk. mg/l	Chlor-a ug/l	Cond. uS/cm	Total P ug/l	Trans. m	Turb. ntu	pH
					NVS		
Beach			30.1	12		2.00	5.94
Epilimnion	1.90	4.17	28.5	11	1.50	1.49	5.89
Inlet			28.8	13		1.85	6.09
Outlet			29.8	11		1.70	6.02

HISTORICAL WATER QUALITY TREND ANALYSIS

Parameter	Trend	Explanation	Parameter	Trend	Explanation
pH	N/A	Ten consecutive years of data necessary.	Chlorophyll-a	N/A	Ten consecutive years of data necessary.
Conductivity	N/A	Ten consecutive years of data necessary.	Transparency	Stable	Trend not significant; data moderately variable.
			Phosphorus (epilimnion)	N/A	Ten consecutive years of data necessary.